The Rocket Blog

A blog about anything related to rockets and space technology from news to how to make your own propellant.

FRIDAY, JULY 20, 2012

The electrode for making perchlorate

The range of suitable electrode materials is very limited. Especially the anode material is critical. The positive charge on the anode promotes oxidation and the evolving oxygen attacks many anode materials. Several anode materials have been considered over the years. Today's main options are listed below along with a short description.

Anode materials (plugged on the +)

Platinum: The obvious disadvantage of platinum is its high price. However, platinum anodes corrode only at a very slow rate and are suitable for perchlorate production. They therefore provide an almost ideal anode material. High efficiency can be reached with platinum and processing of the electrolyte is greatly simplified.

Lead dioxide: Lead dioxide provides an economical alternative to platinum. Lead dioxide anodes can be made at home. This takes some work and effort, but the anodes are cheap, fairly resistant to corrosion even at higher temperatures and are suitable for perchlorate production.

Cathode materials (plugged on the -)

Both stainless and mild steel find widespread use as cathode materials. Brass and copper may also be used. Each of these metals is protected to a certain extent by the negative charge present on the cathode as long as they are submerged and the current per surface area is high enough. Unsubmerged parts of the cathode corrode at a high rate however due to the action of evolving gasses and droplets of cell electrolyte

Unknown at Friday, July 20, 2012

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Unknown Thursday, September 18, 2014

Stainless steel can produce hazardous chemicals when reacting with chloride ions. I really prefer to use carbon elecrodes for both anode and cathode. Is there anything wrong with them?

Reply

Unknown Thursday, September 18, 2014

You are quite true for stainless steel but my experience tells me otherwise. I never had any problem with my steel cathode. For the anode, graphite will not do well because it consumes very quickly and you will end up with a mess of carbon in your solution.

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